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Japan: Aims and Instruments of Industrial Policy

A Research Paper

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Japan: Aims and Instruments of Industrial Policy

A Research Paper

This paper was prepared by [] of the
Office of East Asian Analysis. It was coordinated with
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queries are welcome and may be addressed to the
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**Japan:
Aims and Instruments
of Industrial Policy**

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Overview

*Information available
as of 15 September 1982
was used in this report.*

The policies Tokyo uses to advance Japanese economic interests are more diverse and better integrated than those of most other advanced countries. In addition to broad fiscal and monetary instruments, the Japanese Government selects and nurtures strategic growth industries and assists in maintaining or phasing out industries lacking international competitiveness. The principal bureaucratic responsibility for selecting and implementing industrial policies rests with the Ministry of International Trade and Industry (MITI).

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Data on the financial instruments Tokyo uses to support specific industries reveal a substantial commitment to meld Japanese industrial development to MITI's vision of the future:

- FY 1982 (April 1982–March 1983) general account expenditures for industrial development will exceed \$5 billion, mainly for research and development. Special budgets provide an additional \$1.5 billion, primarily for energy-related activities.
- Government financial institutions catering to industry will provide almost \$27 billion in credit during FY 1982. Of this, about \$4 billion has been allocated to aid the development of high-technology growth industries.
- Tax measures to aid particular industries cost Tokyo an estimated \$875 million in revenue in FY 1981, even though the Ministry of Finance has been cutting back on such tax breaks to hold down the fiscal deficit.

Collectively, these measures distort the allocation of resources to favor industries that the government has selected for growth. This assistance encourages competition within industries, which in turn spurs further technological development. In such industries as microelectronics, where economies of scale are pronounced, the added competition almost ensures that capacity expansion by competing firms will exceed domestic demand. The companies then extend their competition for sales and market share to export markets. The knowledge that MITI will prop up favored industries if they fall into financial difficulty also invites companies and their banks to expand production facilities and research efforts more rapidly than their foreign competitors.

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On the export side of Japan's trade account, industrial policies promoting new industries contribute to the concentration of exports in targeted sectors. Because the industries now being promoted by Tokyo are high-technology industries in which the United States has enjoyed a comparative advantage, US companies and workers will bear the brunt of increased

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Japanese competitiveness. Moreover, rapid advances in microelectronics and robotics enhance the competitiveness of older industries such as automobiles and consumer electronics. Industrial policy also affects the import side of the trade account. Tokyo's efforts to cushion the decline of uncompetitive industries and to prop up industries in financial difficulty inevitably involve some kind of restraint on imports. [REDACTED]

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The industrial policymaking process revolves around MITI. Its Industrial Policy Bureau addresses problems that affect industry in general and also singles out industries needing special assistance because they are crucial to the future or because of the political ramifications of their decline. None of MITI's planning, however, occurs in a vacuum. It consults with advisory councils that include industry, labor, the media, and academic representatives. Proposed plans and policies are adjusted to accommodate objections within the councils, or implementation is delayed until the objectors are persuaded to concur. [REDACTED]

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MITI's influence over industry comes from several sources. One is its regulatory power. Remaining on good terms with the appropriate industry bureau ensures businesses that their concerns will be heard when regulations are made. Even more important are subsidies, loans, and special tax breaks:

- MITI, often with the support of interested Diet members, lobbies the Ministry of Finance to include in the annual general account budget subsidies for projects that will help fulfill the plans drawn up by industry bureaus.
- MITI also helps formulate the annual Fiscal Investment and Loan Program, which allocates funds from the postal savings system and national pension funds to government financial institutions. In addition, MITI reviews applications for industrial policy-related loan programs of the Japan Development Bank, the Export-Import Bank, and the Small Business Finance Corporation to ensure consistency with relevant industry plans. [REDACTED]

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Government planning on an industry-by-industry basis is most prevalent in high-technology industries, where Japanese firms compete with powerful foreign rivals, and in depressed industries fighting for survival. Well-established industries, such as consumer electronics, automobiles, and steel are now given only minimal attention. [REDACTED]

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The industries selected for government assistance change with time. As the microelectronics and machine tool industries mature, official support will decline. Tokyo instead will concentrate its resources on new growth industries such as fiber optics, composite materials, fine ceramics, and biotechnology. An increasing share of the resources devoted to alleviating the plight of declining industries will go to the aluminum refining, petrochemical, and pulp and paper industries. [REDACTED]

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The forms in which Tokyo provides assistance also change. New loan programs are being proposed to help the construction of R&D facilities, to fund venture capital businesses, to aid depressed industries, and to finance the construction of factories by Japanese subsidiaries of foreign firms. The structure of joint R&D projects has also been altered as a result of growing foreign pressure and the increasing technological prowess of Japanese corporations. MITI has been using R&D projects to ensure that several firms get access to new technologies and thereby to create the basis for strong competition within key industries. As long as the projects were based on advanced foreign technologies, Japanese companies were eager to participate, but foreign firms saw little point in it. [REDACTED]

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Now that new projects are being organized to advance the state of the art in various fields, leading Japanese companies must ask themselves whether the potential gains outweigh the potential losses of technology to competitors. Concurrently, foreign pressure for access to these projects is growing as foreign companies begin to see possible advantages from participation. [REDACTED]

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To get the most from the projects for Japan, however, MITI is more interested in securing the participation of foreign technological leaders. [REDACTED]

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Japan: Aims and Instruments of Industrial Policy

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MITI: The Driving Force

Japan's economic policy makers concern themselves not just with the manipulation of fiscal and monetary policy instruments familiar to their US counterparts but also with a much broader range of industrial policy tools. In contrast to fiscal and monetary policies that influence the economy's aggregate level of output, industrial policy adjusts the product mix and tries to minimize each industry's cost of production.¹

The importance Tokyo attaches to industrial policy stems from Japan's status as a latecomer to industrial development and the country's lack of natural resources:

- Japanese industrial policy theorists, such as Hiroya Ueno, assert that complete reliance on the market to determine the product mix of their economy would have condemned Japan to permanent inferiority vis-a-vis the older industrial economies.
- Because Japan entered the postwar period with an abundant labor force and little else, the theorists believe that if Tokyo had not intervened to promote the growth of heavy industry in the 1950s, Japan would have remained a producer of labor-intensive textiles, apparel, cutlery, and toys.
- Competition from developing countries with equally abundant labor forces then would have prevented Japanese income levels from rising rapidly.

¹ Japan's postwar economic success is attributable to numerous factors, including the aggressive behavior of corporations, the widespread availability of foreign technology, reindustrialization during a period of cheap raw materials and energy, government policies that favored savings and investment, and favorable exchange rates. This paper treats in detail one type of governmental activity—industrial policy. The interrelation between industrial policy and other factors, including exchange rates, will be dealt with in a separate paper.

Moreover, the same proponents of industrial policy maintain that without government intervention foreign owners of scarce resources (including the technology of US multinational corporations and the oil of the OPEC cartel) would have been able to siphon off income that Japan needed to finance its own growth and take control of industries essential to Japan's future.

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The degree to which industrial policy has displaced the market mechanism has varied with the challenges facing the Japanese economy. In the early postwar period when Japan suffered from a lack of capital, technology, raw materials, and foreign exchange, the government bureaucracy controlled the allocation of these resources and had the legal authority to direct almost all aspects of business. By 1952 a semblance of normality had been restored and the tools of the industrial policy maker were limited somewhat. Nevertheless, the government continued to control foreign exchange, imports of technology, and credit allocation by the banking system. Tokyo also retained and used the authority to give preferential financing, industry-specific tax breaks, and protection from foreign competition. Moreover, the authority to approve cartels enabled the government to regulate competition within industries.

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As the steel, shipbuilding, chemical fertilizers, plastics, petrochemicals, automobile, and electronics industries gained international competitiveness during the 1960s and 1970s, foreign exchange shortages and technological backwardness ceased to restrain Japanese economic growth. Partly out of the realization that extensive controls were no longer needed and partly from the recognition that Japan would have to conform to Western economic policies to gain membership in the IMF, GATT, and OECD, the Ministry of Trade and Industry began to forgo direct controls in 1964. It shifted from formal controls displacing the

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market mechanism to informal administrative guidance and inducements such as low-cost loans for capital investment and research and development grants. [REDACTED]

The smoothness with which the Japanese have been able to conduct industrial policy is the product of postwar Japan's extraordinarily broad consensus in favor of rapid economic growth and a long period of experimentation during the 1930s and 1940s. It is not, in our view, the result of a uniquely Japanese ability to work together. The German industrial rationalization movement of the late 1920s influenced Japan's prewar efforts at industrial policy. From the Germans, Japanese bureaucrats got the idea that cooperation among enterprises to fix levels of production, set prices, limit entry into the industry, and control marketing was superior to the cutthroat competition that existed in the small business sector during the 1930s. They also concluded that the long-term health of businesses depended on constant efforts to lower costs, not just make profits. Cooperation and cost reduction have remained articles of faith for MITI bureaucrats. [REDACTED]

Today MITI has largely turned the function of resource allocation over to the market. But it remains active in a number of other areas, all set forth in official descriptions of MITI's organization (the industries cited as examples are our own selections):

- Sponsoring long-term plans and forecasts that identify industries of high future value to the economy (computers, telecommunications equipment, aerospace, and medical electronics).
- Helping to advance strategic industries producing materials or components (composite materials, biotechnology, and microelectronics) that add to the competitiveness of final products (chemicals and machinery exports).
- Supporting research and development in fields where the capital requirements are too great, the risks too high, or the gestation period too long for private enterprises to bear alone (nuclear power, aerospace, and computers).

- Improving economies of scale in industries where cost reduction will significantly benefit the economy (such as semiconductors, fiber optics, machine tools, robotics). [REDACTED]

Intervention is not limited to strategic growth industries. The coal, petroleum products, chemical fertilizer, textile, aluminum smelting, and shipbuilding industries are also the objects of government attention. MITI defines these sectors as "structurally depressed industries." In such cases *The Vision of MITI Policies in the 1980s*, a general statement of the principles guiding current policy, states that intervention should (a) promote efficiency over the medium and long term, (b) supplement (or ameliorate) the effects of market forces—but not attempt to block their influence—and (c) be temporary. [REDACTED]

In the case of structurally depressed industries, however, political considerations, MITI's own bureaucratic interests, and a desire for Japan's economic security often lead MITI to disregard these principles. What were once temporary measures to aid the coal and textile industries have lingered because the unemployment that would otherwise result is unacceptable to many members of the Diet. A concern for economic security keeps the government involved in the oil refining and shipbuilding industries. MITI also treats the oil industry as an instrument of the government's energy policies. Moreover, intervention sometimes creates its own momentum. The Japanese press reports that MITI is now trying to devise a set of policies to aid the petrochemical industry, whose current woes stem in part from MITI regulation of petroleum product prices. [REDACTED]

Japanese businessmen do not necessarily welcome MITI intervention, although many are attracted by the security that it provides. The steel industry, which has received substantial official support over the years, still consults closely with MITI when major marketing and investment decisions are made. On the other hand, the relatively sound companies in the automobile industry make their investment and marketing decisions autonomously. Entrepreneurial firms

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that rose to prominence in the postwar era are less likely to work smoothly with MITI than an industry like steel. The founders of Honda and Sony, for example, vociferously support reforms to shrink the size and influence of government. [REDACTED]

The Policymaking Process

MITI's relatively small size belies its broad range of responsibilities. It has the fewest employees of all the economic ministries—14,000, of whom only 2,285 work in the policymaking bureaus. The locus of power rests with a group of 200 to 400 elite bureaucrats, recruited chiefly from Tokyo University, at a pace of about 25 a year. MITI also controls a smaller share of the general account budget than other economic ministries. One US academic expert points out that smallness may be an advantage because it partially frees MITI from control by the Finance Ministry's Budget Bureau. [REDACTED]

MITI's responsibilities fall into two broad headings: trade and industry. Infighting between its industrial and trade factions once dominated intraministerial politics. By the 1970s, however, this began to fade as the need to adjust domestic industrial policy to the international trading system grew increasingly important. Today, an up-and-coming MITI bureaucrat needs experience in both industry and trade. [REDACTED]

In industry, MITI's policy tools include statutory authority to:

- Regulate electric power and gas companies.
- Promote development of domestic natural resources and monitor supplies of imported resources and energy.
- Regulate patents.
- Monitor, and in some cases control, the import of technology.
- Coordinate lending activities of government financial institutions.
- Monitor small business.
- Conduct research relating to mining and industrial technology.
- Collect statistics on commerce, mining, and manufacturing.
- Regulate industrial location, environmental pollution, and industrial and mine safety. [REDACTED]

The broad scope of MITI's responsibilities has a number of implications for industrial policy. Some aspect of MITI's regulatory power affects almost all manufacturing industries and, therefore, "advice" from the Ministry cannot be ignored. For example, as part of its effort to cushion the decline of the aluminum smelting industry, MITI has been studying the possibility of having electric power provided to smelters at lower rates. MITI's regulatory authority over the electric power companies would make this possible. [REDACTED]

The Industrial General Staff. The Industrial Policy Bureau (IPB) is the general staff that supplies the planning and coordination necessary to capitalize on this broad range of responsibilities. According to a leading US authority on MITI, the Ministry's internal pecking order reflects the IPB's high status. The Bureau's director general is widely recognized as the third-ranking man in the Ministry and heir apparent to the administrative vice minister, which is the senior position for career civil servants. The pecking order presented in table 1 is our estimate of the current ranking of MITI officials in the policymaking process. Of course, as the issues confronting MITI and the people filling the offices change, the ranking also may be affected. [REDACTED]

"Long-Term Visions." The IPB's planning and coordination functions are vested in its Industrial Structure Division. The division's most important product is the "long-term vision," an analysis of the forces likely to shape the economy in coming years and recommendations on the direction in which the economy should evolve. Major "visions" were produced in 1964, 1971, 1974, and 1980. Updates are issued annually. Division officials, drawing on data from other government agencies and private organizations, do the basic research and analysis, but the formal author is the Industrial Structure Council (ISC), an advisory panel to the Minister. Several former MITI officials are on the ISC to ensure that the final version is consistent with the Ministry's industrial policy objectives. [REDACTED]

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Table 1
Ranking for MITI Career Officials

Order	Office	Incumbent
1	Administrative Vice Minister	Ichiro Fujiwara
2	Vice Minister for International Affairs	Shohei Kurihara
3	Chief, Industrial Policy Bureau	Kazuo Sugiyama
4	Director General, Agency of Natural Resources and Energy	Kunio Komatsu
5	Director General, Small and Medium Enterprise Agency	Kazuo Kamiya
6	Director General, Patent Agency	Kazuo Wakasugi
7	Director General, International Trade Policy Bureau	Tadayoshi Nakazawa
8	Director General, Machinery and Information Industries Bureau	Toru Toyoshima
9	Director General, Minister's Secretariat	Keiichi Konaga
10	Director General, Basic Industries Bureau	Moriaki Ueda
11	Director General, Industrial Location and Environmental Protection Bureau	Genichi Fukuhara
12	Director General, Consumer Goods Industries Bureau	Manabu Shiga
13	Director General, International Trade Administration Bureau	Shinji Fukukawa

The long-term visions serve several purposes. One is to instill optimism about the future. Another is to rally political support for MITI programs to develop growth industries. In the economic chaos of the early postwar years few people questioned MITI's intervention, and no efforts were made to develop public justifications for aiding particular industries. Today MITI must convince the public that the growth of a particular industry will benefit the economy as a whole to avoid criticism for overinvolvement in the economy or for favoring big companies.

Liberal Democratic Party Diet members have set up caucuses to help achieve objectives outlined in long-term visions. These standing caucuses help MITI not only when it needs legislation passed but also in the

annual budget negotiations with the Ministry of Finance. Without substantial organized support in the Diet, industrial policy oriented research and development (R&D) probably would not have been exempted from the zero ceiling on general account budget increases in the current fiscal year. We expect the R&D budget will continue to grow at a higher rate than next year's general account budget as a whole, which is expected to increase 1.5 percent.

The long-term vision does have limitations. Most notably, it must compete with a large number of white papers and plans churned out by other ministries and their advisory councils. MITI's main rival, the Economic Planning Agency, has published a series of macroeconomic plans since 1955. Moreover, the Ministry of Finance has successfully resisted all efforts to link its budget decisions to either MITI's or EPA's long-term planning.

"The Vision for the Eighties." MITI's "Vision for the Eighties" is actually a set of documents. The core report, *The Vision of MITI Policies in the 1980s*, was approved by the ISC and submitted to the Minister in March 1980. Its 223 pages sketch out the principal challenges expected to confront Japan, delineate the broad socioeconomic goals the country should work toward, and lay out some of the trade and industrial policy options available to the government.² The implications for individual industries are spelled out in the 318-page *Industrial Structure of Japan in the 1980s: Future Outlook and Tasks*, published in January 1981. In addition, the Small and Medium Enterprise Policymaking Council, an advisory group to MITI's Small Business Agency, has prepared its own paper. Special committees are also drawing up papers on the information industry and the paper and pulp industry. And MITI has announced plans to draft a paper for the aerospace industry by next spring.

The Vision's Policy Recommendations. The Vision's analysis of the problems confronting Japan in the 1980s and the suggested solutions could stand alone

² MITI's view of the challenges facing Japan in the 1980s is summarized in the appendix to this paper.

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as a set of informal guidelines for business executives and government officials. The research and planning departments of Japanese banks and corporations do in fact summarize and further refine many of the Vision's themes in their own analysis of future developments. MITI, however, is not content to let the market dictate the pace. In the Vision, the environment for private capital investment, the key to economic growth and the vehicle for change in industrial structure, has gotten worse in recent years:

- Uncertainty has been created by the international political situation, the volatility of energy supplies, the chronic stagflation in the industrial economies, trade disputes, and the fluctuation in the yen exchange rate.
- Domestically, new factory sites are scarce and environmental constraints more severe.
- Technological innovations in electronics hold great promise but are unlikely to inspire capital investment booms on the same scale that transistors, synthetic fibers, television, or computers have. []

In the face of these uncertainties, MITI believes market incentives may not stimulate enough capital investment to accomplish the goals it has set. The Vision lists at least five basic objectives that the Japanese Government should pursue to avoid these binds. []

First, private capital investment in strategic growth industries such as computers, information processing, aircraft and aircraft engines, aerospace, nuclear power, industrial plant engineering, and robotics must be stimulated through the use of special tax measures, subsidies, and financing from official institutions. New investment tax credits also may be necessary. []

Second, the government must subsidize private investment in the energy sector. To do this, MITI recommends that:

- Regulations on large-scale borrowing by energy firms in private capital markets be eased.

- Official loan guarantees and low-interest loans be offered for development of oil wells and coal mines, the conversion of existing power plants from oil to other fuels, and the installation of energy-efficient production facilities.

- An investment tax credit system for purchase of energy-conserving equipment be enacted. []

The third and fourth measures—moving industrial plants to areas outside the Pacific industrial belt stretching from Tokyo to Fukuoka and providing government assistance to promote new capital investment by small business—have been formulated more for their political appeal than their economic importance. The ruling LDP draws substantial electoral support from rural areas outside the major industrial cities and from the owners of Japan's 5.8 million small businesses. Reflecting this constituency, MITI advocates lengthening repayment periods, extending deferments, and raising the limit on loans to small businesses. []

The government's fifth field of concern is industrial technology policy. The Vision recognizes that the private sector bears primary responsibility for technological innovation. Nevertheless, MITI argues that the scope for government involvement will increase as future Japanese research and development shifts from development, where the payoffs are relatively clear, to exploratory research where the risks are much greater. This involvement includes research in government laboratories and contracts to private firms. []

Implementing the Policy

Even though the Vision is probably the single most influential statement of the direction in which Japan ought to be moving in the 1980s, it does not automatically become government policy. Indeed, it can only be implemented piecemeal through laws providing MITI or other ministries authority to regulate specified industries or through the financial incentives approved in the annual budgetary process. []

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The Vertical Bureaus. Within the Japanese Government, responsibility for the selection and use of policy tools generally is in the hands of vertically structured industry bureaus. Vertical structure refers to the practice of creating a division or section to oversee the activities of each major industry within a bureau's purview. MITI's Machinery and Information Industries Bureau, for example, includes divisions covering the automobile, electrical machinery and consumer electronics, industrial electronics, aircraft and ordnance, cast and wrought products, and industrial machinery industries. Each division monitors exports and imports, production, sales, distribution, and technological trends. Similar industry bureaus and divisions exist in the Ministry of Health and Welfare (Pharmaceutical Affairs Bureau), the Ministry of Agriculture, Forestry, and Fisheries (Processing Industry Division of the Food and Marketing Bureau), and the Ministry of Transport (Ship Bureau). [REDACTED]

The extent of a division's authority varies widely. Where no specific legislation granting special powers exists, the division may be limited to monitoring developments and coordinating with other divisions in the bureau, other bureaus within MITI, and other ministries. Nonetheless, this coordination function is a source of influence. The appropriate industry division will be consulted before any other part of MITI takes an action affecting that industry. Therefore, companies must remain on good terms with the division to ensure that their interests are spoken for in the councils of government. They normally do so by forming an industry association that remains in day-to-day contact with the staff of the appropriate bureau. [REDACTED]

Special legislation greatly enhances an industry bureau or division's influence over an industry. The Law for Promotion of Designated Machinery and Information Industries (MIIL) gives MITI authority to promote the development of industries producing electronic machinery, nonelectronic machinery, and software programs (see table 2). The MIIL, enacted in 1978 and effective for seven years, is the descendant of two series of laws that have influenced the machinery and electronics industries since 1956. A sunset clause ensures periodic revisions to keep the laws in step with the rapid pace of change in these industries. [REDACTED]

Table 2

Japan: Selected Sectors for Which MITI Drafts Plans Under the Machinery and Information Industries Law (MIIL)

High-performance computational-type electronic computers and peripheral equipment with remote data processing capability
Communications equipment
High-performance facsimile storage and switching equipment
Integrated circuits
Semiconductor elements
Magnetic bubble memory equipment
Large-capacity magnetic cartridge memory equipment
Materials used in electronic equipment
Electronic tubes
Liquid crystal displays
Equipment using lasers
Electronic apparatus for use in aircraft
Medical electronics
Ultrasonic equipment
Electronic measuring instruments
Electronic industrial meters
High-performance radiation-measuring instruments
High-performance density-measuring instruments

The MIIL grants MITI authority to set guidelines and to prod industries to move in the desired direction. Specifically, MITI is authorized to draft "upgrading plans" for each of 32 electronics industry segments and 56 machinery industry segments. Each plan is the result of a complex set of government-industry interactions. The MITI industry division preparing the initial draft works from capital investment plans submitted by individual manufacturers, consultations with industry association or company representatives, statistics compiled by government or industry sources, and international data that have been gathered by MITI's own overseas offices or by industry sources. [REDACTED]

Draft plans must be submitted to the Aviation and Machinery Industries Deliberation Council, a MITI advisory organ, before officially being promulgated. The Council's membership is indicative of the high

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degree of contact that exists between MITI industry divisions and industry associations. In 1979, of the 69 members serving, 27, including the chairman and vice chairman, were industry association officials. Other members included:

- Nine executives from machinery and electronics manufacturers.
- Seven academics.
- Six representatives of research foundations related to the machinery and electronics industries.
- Five executives of government-owned corporations.
- Four journalists, three from business dailies.
- Four representatives from economic research organizations.
- Three government financial institution executives.
- Three labor representatives.
- One private-sector banker. [REDACTED]

The actual review of the details contained in plans for individual industry segments occurs in 16 subcommittees staffed by 171 specialists. The subcommittees report to the Plans Committee, which in turn reports to the Council as a whole. By the time a plan passes through this process, it can hardly be labeled the work of MITI alone. It represents a consensus of MITI and many, though not necessarily all, of the major companies in the concerned industry. [REDACTED]

The MIIL grants MITI only limited authority to implement plans. The limits placed on MITI's authority in every law of this type reflect the concern of business that government serve its interests rather than vice versa. On funding, the law specifies only that "the government shall endeavor to secure the necessary funds"; the Ministry of Finance is under no obligation to approve funding. [REDACTED]

Under the MIIL, the only specific authority MITI has exists in the case when it orders an industry to trim production capacity because firms are uncompetitive. In doing so, MITI can instruct manufacturers to share technology, to restrict production at certain facilities, and to impose other cost-cutting techniques. Price fixing, however, is not allowed. Before issuing instructions or orders, MITI must confer with the Fair Trade Commission (the representative of consumer interests) and consult with related enterprises.

Ministerial authority is also circumscribed by weak enforcement mechanisms. Fines cannot exceed \$2,000 per violation. [REDACTED]

There is, nevertheless, enough authority for MITI to organize cartels to allocate production in times of slack demand or to take measures to improve industrial competitiveness. MITI attempts to compensate for its lack of direct enforcement power by emphasizing the importance of its plans as a guideline for corporate planners. Officials never fail to point out that the plans guide decisionmaking within MITI and that companies whose investment plans fit into MITI's framework are more likely to receive government research and development funds or financing from a government bank. Almost every major study of Japanese industrial policy notes that private banks also are more likely to be responsive to companies who cooperate with MITI. [REDACTED]

Planning for Depressed Industries. MITI attempts to foster close government-industry interaction even where it is not specially authorized to do so, usually by working through the industry committees of the Industrial Structure Council. Most recently, for example, MITI has tried to put together a policy to deal with the depressed petrochemical, chemical fertilizer, and pulp and paper industries. The appropriate Petrochemical and Chemical Fertilizer Subcommittees were first instructed to recommend policy solutions. The committees then initiated a series of hearings in which the views of MITI, the industry seeking relief, other industries, and advocates of broader public interests were heard. The process, however, does not always lead to an agreed course of action. In the case of petrochemicals, conflicts between raw material suppliers and the industry and concern that Japan's commitment to free trade precluded restrictions on cheap imported petrochemicals have paralyzed the planning process since January. [REDACTED]

The leading Japanese business newspaper, *Nihon Keizai*, reports that MITI is drafting a law to strengthen its formal powers to reorganize structurally depressed industries. The current law allows MITI

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to organize cartels to reduce production capacity in the open hearth and electric furnace steel, aluminum refining, synthetic fiber, shipbuilding, ammonia, and a few other industries. The new law would expand MITI's scope to include joint production, investment, purchasing, marketing, and R&D. It would also permit MITI to set preferential prices for petroleum products and electricity used by these industries. []

The new law would pose a host of problems for foreign firms. In general, cartels established to reduce production will not benefit domestic manufacturers unless lower cost imports are excluded from the market. Quotas, higher tariffs, or some type of informal mechanism would have to be used to restrain imports. Moreover, joint purchasing would enable the Japanese industry to negotiate with a single voice and possibly wring greater concessions from foreign sellers. []

Other aspects of MITI's proposal also raise serious questions. Reducing the price that a depressed industry pays for petroleum products or electricity is a subsidy to the depressed industry. Loans from government financial institutions might also involve a substantial subsidy. Subsidies in any form would allow the industry to sustain higher levels of capacity and production and consequently to reduce the opportunity for foreign firms to export to Japan. []

MITI Influence and the Budget. MITI's influence over industrial activity owes more to its ability to lead with the carrot of R&D funds or access to low-interest loans rather than the stick of legal directives. The degree of MITI influence over a firm is in this sense a function of its skill at harvesting carrots during the annual budgetary process. A leading US scholar of the Japanese budget process points out that appropriations precede legislative authorization in Japan. The budget therefore provides an excellent window to predict industrial policy, or for that matter, any other activity of the Japanese Government. []

Japan has three types of budgets: the general account, special accounts, and the Fiscal Investment and Loan Program (FILP). Subsidies, some loans, and the interest subsidy for loans offered at rates below cost are generally disbursed from the general account. General account revenue comes mainly from taxes (about

Table 3
Japan: FY 1982 General Account
Budget Items
Related to Industrial Policy

Million US \$

Industrial Policy	Budget Item
Total expense	5,093.2
Science and technology	
Civil airliner development	12.3
Computer industry promotion	26.6
Information processing promotion	13.1
Development of a jet engine for a civil airliner	23.4
Mining and manufacturing technology	58.3
Large-scale industrial technology projects	53.5
Agency of Industrial Science and Technology—laboratory expenses	132.4
Agency of Industrial Science and Technology—general expenses	8.0
Science and Technology Agency—S&T promotion	507.8
Ocean development	24.5
Nuclear power	736.9
Science and Technology Agency—research facilities	103.2
Ministry of Education—scientific promotion	183.5
Ministry of Health and Welfare—scientific research	57.4
Ministry of Transportation—R&D activities	23.9
Ministry of Posts and Telecommunications—radio research laboratory	19.4
Energy	
Agency of Natural Resources and Energy—budget	1,735.5
Agency of Industrial Science and Technology—energy R&D	41.1
Other	
Capital for small business financing organizations	283.5
Countermeasures for industrial pollution	4.3
Promotion of industrial relocation	44.9
Measures to restructure the textile industry	0.7
MITI inspection facilities	13.9
Patent Agency	89.9
Small Business Agency	785.9
MITI headquarters	55.3
Maritime industry subsidies	31.0
Funds for stabilization of the shipbuilding industry	6.0

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70 percent) and the sale of deficit financing bonds (26 percent). FILP, a separate budget which in FY 1982 was about 40 percent the size of the \$218 billion general account budget, allocates funds from the postal savings system and national pension funds to public lending institutions that finance a variety of activities. []

Despite its reputation as the general staff of Japanese industrial development, MITI spends only 1 to 1.5 percent of the general account budget. However, expenditures related to industrial policy are not confined solely to MITI. Other agencies also spend on industry, energy, and R&D. When these items are added to the MITI budget, industrial policy expenditures rise to approximately \$5.1 billion, or 2.3 percent of the FY 1982 budget (see table 3). This percentage has changed very little from year to year. []

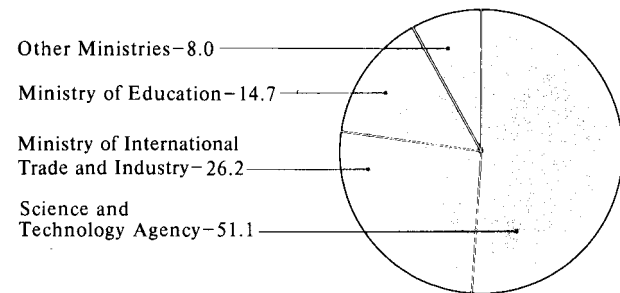
Over 70 percent of this money—\$3.8 billion—is allocated for energy and R&D projects. Energy-related projects received the biggest funding increases in FY 1982. Reflecting Tokyo's effort to hold down the fiscal deficit by trimming spending, nonenergy research generally received modest increases while most other appropriations remained virtually unchanged or were cut. A similar pattern is likely in FY 1983. Perhaps because large firms are the primary beneficiaries of government energy and R&D spending, most of the remaining \$1.3 billion in industrial policy spending goes to small business. []

Other large appropriations for items not related to R&D include \$90 million for the operation of the Patent Agency, \$55 million for the administrative expenses of MITI headquarters bureaus, \$48 million to subsidize the maritime industry, and \$45 million to promote industrial relocation. Almost two-thirds of the maritime industry subsidy actually benefits the shipbuilding industry by lowering the financing costs of newly constructed ships. The remaining \$17 million subsidizes shipping services to Japan's outer islands. []

An additional \$1.5 billion in energy-related expenditures is disbursed through the special account budgets for electric power, coal, petroleum, and alternative energy (see table 4). The \$1.5 billion figure represents the \$3.2 billion total expenditures of these accounts

Japan: Nonenergy Research and Development Spending by Agency, FY 1982

Percent



US \$ 1,252 Million

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minus the \$1.7 billion transferred from the general account and is funded by the electric power resources diversification tax levied on consumers and a tax on imported petroleum. []

Budgetary expenditures, loans, and special tax measures related to industrial policy are, as MITI asserts they should be, only supplements to the efforts of private industry. In FY 1979, the most recent year for which we have complete official survey data, Japanese companies and public corporations spent \$11.5 billion (65 percent) of the \$17.6 billion national expenditure on R&D. Spending by private nonprofit organizations

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Table 4 *Million US \$*
Major Industrial Policy Related
Special Account Expenditure Budgets:
Net of Transfers From the General Account

Energy-Related Projects	Transfers
Electric power resources diversification special account	809.8
Electric power resources location account	316.2
Location assistance	310.1
Other	6.1
Electric power resources diversification account	493.6
Hydroelectric development	23.0
Geothermal energy development	40.7
Promotion of coal-fired thermal power generation	28.5
Research and development	87.0
Nuclear power development	48.6
Science and Technology Agency-related projects	250.9
Other	14.9
Coal, petroleum, and nonpetroleum alternative energy special account, net of transfers from the general account	2,389.2
Coal account	598.9
Coal mining industry rationalization	211.3
Mining and stabilization pollution counter-measures	255.1
Development funds for declining coal mining regions	38.1
Aid for workers leaving the coal mining industry	36.6
Employment training funds for declining coal mining regions	45.6
Other	12.2
Petroleum and nonpetroleum alternative energy account	1,790.3
Petroleum development and measures to ensure petroleum supplies	591.5
Petroleum stockpiling	879.9
Rationalization of petroleum production and distribution ^a	69.3
Nonpetroleum alternative energy ^a	236.4
Reserves	13.2
Transfers from the general account	1,692.3

^a These items include R&D expenditures totaling \$133.2 million.

accounted for \$1.2 billion. Central and local governments combined spent only \$4.9 billion on R&D in all fields, including nuclear energy research (approximately \$863 million) and space research (\$433 million). [REDACTED]

Private-sector efforts have been greatest in strategic growth industries. Official survey data indicate that the electrical machinery industry, which includes computer, microelectronic, and telecommunications equipment makers, spent \$3.1 billion (3.4 percent of sales) for R&D in FY 1979. The eight largest companies in telecommunications, electronics, and measuring instruments allocated 5 percent of sales to R&D. Only the 5.5 percent of pharmaceuticals, a growth industry scrambling to capitalize on the biotechnology boom, is higher. [REDACTED]

MITI has received a report from its Industrial Research Institute concluding that Japan's industrial policy related budgetary expenditures are low compared to those of other advanced countries, according to Japan's leading business daily. Although it does not give comparisons of total spending, the article does cite a \$270 million US Department of Defense program between 1980 and 1985 for the development of very large scale integrated semiconductors, other DOD and NASA R&D contracts, and US subsidies for basic research in universities. Judging from these examples, the report makes Japanese spending look comparatively low by lumping military and civilian research expenditures together. [REDACTED]

Lending by Official Institutions. Next to general and special account spending, direct lending by government financial institutions is probably the second most important financial instrument of industrial policy. The amount is substantial. About 25 percent of the \$89 billion Fiscal Investment and Loan Program budget for FY 1982 will be doled out for industrial development by the Japan Development Bank (JDB), the Export-Import Bank, and two major financing institutions serving small business. In addition to the

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funds budgeted in FILP, these institutions have their own accumulated capital (funds paid in by the government in the past plus retained earnings) to loan out:

- In FY 1981, JDB added \$1.4 billion of its own funds to the \$3.3 billion received through FILP.
- The Export-Import Bank added \$1.3 billion to the \$3.9 billion budgeted in FILP.
- The small business institutions augmented the \$15.1 billion channeled through FILP with \$5.9 billion in their own capital and retained earnings. [REDACTED]

The interest rate, ranging for the most part from about 1 percent below the long-term commercial prime rate to prime (8.9 percent as of 1 September), generally must be sufficient to cover the government's cost of funds. For some high-priority programs, interest rates below the cost of funds are offered, but the difference must be covered by a subsidy from the general account. Compared with loans from commercial banks, loans from official institutions are particularly advantageous because the banks usually require that some of the borrowed funds remain on deposit. As a result, the effective interest rates of commercial banks are usually higher. [REDACTED]

A portion of these loans—about \$4 billion in FY 1980 by our estimate—support the development of strategic growth industries. Export-Import Bank data, for example, show that \$1.4 billion out of \$1.9 billion in export financing during FY 1980 was provided to manufacturers of electrical, communications, and industrial machinery. Companies in growth industries also benefit from Export-Import Bank overseas investment financing and buyer's credits. [REDACTED]

The JDB and the Small Business Finance Corporation (SBFC) are the chief suppliers of official financing for domestic capital investment. According to a Japanese machinery industry publication, JDB has allocated \$475 million, 8 percent more than a year ago, for loans to promote high-technology industries in FY 1982. Because capital investment is falling off in most other sectors, high-technology industries are also likely to receive most of the \$110 million set aside to encourage the location of factories in depressed areas. Companies supplying machinery to the nuclear power

industry also stand to gain from the \$686 million in loans slated for nuclear power development in FY 1982. [REDACTED]

The SBFC can provide up to \$700,000 in loans to small businesses (firms with less than \$440,000 in capital and less than 300 employees). Loans are made for a maximum of 10 years with initial repayments of principal deferred for two years at most. Perhaps 20 percent of the \$3.6 billion that SBFC loaned to manufacturing industries in FY 1980 went to the machinery sector, where high-technology industries are concentrated. Unlike JDB, SBFC provides operating funds as well as capital investment. In FY 1980, 57 percent of all SBFC loans were operating funds. [REDACTED]

The JDB and SBFC determine their budgets in different ways. The JDB submits an annual budget to the Ministry of Finance, which passes it on for Cabinet and, ultimately, Diet approval. The SBFC prepares a quarterly lending plan, which must be approved by both MITI and the Ministry of Finance. [REDACTED]

Once the JDB budget and SBFC lending plans are approved, MITI issues notices listing the types of loan programs available. Interested businesses then submit applications to the Industrial Finance Division in the case of JDB loan applications and the Finance Division of the Small and Medium Enterprise Agency in the case of SBFC loans. A request is sent to the appropriate bureau in MITI to determine how consistent it is with agreed-upon plans for the industry. If satisfied, MITI nominates the application for JDB or SBFC approval. [REDACTED]

JDB lending policies for strategic growth industries tend to reinforce MITI's objectives of fostering new technologies and promoting competition. Emphasis is placed on getting new technologies started, not financing the expansion of established industries. A recent contract study notes that an unwritten rule limits the JDB to financing only the first plant in the

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case of a newly commercialized technology. Japanese writers also believe JDB loans have a multiplier effect. Because a JDB loan indicates MITI approval of a company's plans, private banks are eager to lend to the same company. []

JDB promotes competition by favoring firms with only limited access to private capital markets. JDB has denied funding to the largest firms in some cases to prevent oversubscription of its loan programs. In the case of smaller companies, the JDB also has assumed a leading managerial role in putting together a consortium to fund the 50-percent share of a project not covered by JDB loans. []

In quantitative terms, loans from government financial institutions are no more than a supplementary source of funds for industry. About 5 percent of the net increase in externally supplied capital for industrial investment in FY 1981 (\$9.9 billion) came from official institutions. Data from a MITI survey of leading electrical machinery manufacturers—including producers of computers, microelectronics, and telecommunications equipment—indicate that government financial institutions play an even smaller role in high-technology industries. The firms surveyed required \$3.7 billion to finance capital investment and repay long-term debt in FY 1981. Government institutions provided only \$48 million, or 1.3 percent. Private financial institutions funded 15.5 percent. Stocks and bond sales generated another 11.5 percent. The remaining 71.7 percent was internally funded. []

Lending programs for strategic growth industries are in fact only a small percentage of total JDB and SBFC activities. The JDB, for example, also provides loans for urban and regional development (\$1.3 billion in FY 1981), antipollution projects (\$360 million), and resource and energy conservation (\$1.8 billion). Many loans for pollution control and energy conservation have gone to established industries such as steel. As table 5 indicates, the general machinery, electrical machinery, transportation machinery, and precision machinery categories had only \$635 million in loans outstanding, compared with \$1.2 billion for steel and \$1.85 billion for chemicals. []

The authority of government financial institutions to lend to depressed industries also is limited. The Japan

Export-Import Bank's \$3 billion in outstanding credits for ship exports is the largest single loan program benefiting a depressed industry. The JDB also aided the shipbuilding industry with a \$514 million lending program in FY 1981. MITI will probably propose giving the JDB authority to help other depressed industries during FY 1982. The SBFC has several programs that provide loans to small businesses in depressed industries. []

The Tax System. Compared with subsidies and loans, tax measures directed toward specific industrial policy objectives play a relatively small role today. In FY 1981, for example, depreciation from programs designed to spur specific industries was equal to only 3 percent of regular depreciation claimed by manufacturing industries. In principle the postwar tax system is designed to minimize special tax treatment of individual industries. In the 1950s and 1960s, special tax measures were introduced to stimulate investment, but in the last decade the Ministry of Finance has been trying to reaffirm the original principle. Tax measures also do not give the industrial policy bureaucracy the same degree of discretionary power that subsidies or loan programs do. Once passed by the Diet, administration of tax laws is in the hands of the Ministry of Finance. []

Nevertheless, tax measures have a significant impact on certain industries. MITI provides incentives for specific types of industrial development by lobbying each year for changes in the Special Taxation Measures Law. These measures fall into three areas: added depreciation, tax-free reserves, and tax credits. Special depreciation can take the form of either increased initial or accelerated depreciation. In some cases this permits a writeoff of over half the cost of new equipment in the first year. In neither case can cumulative depreciation exceed cost. The Ministry of Finance estimates that special depreciation measures cost the national treasury \$514 million in revenue in FY 1981. The primary beneficiaries of this tax break were purchasers of pollution control devices, waste recycling facilities, energy conservation equipment, and small businesses investing in new plant and equipment. []

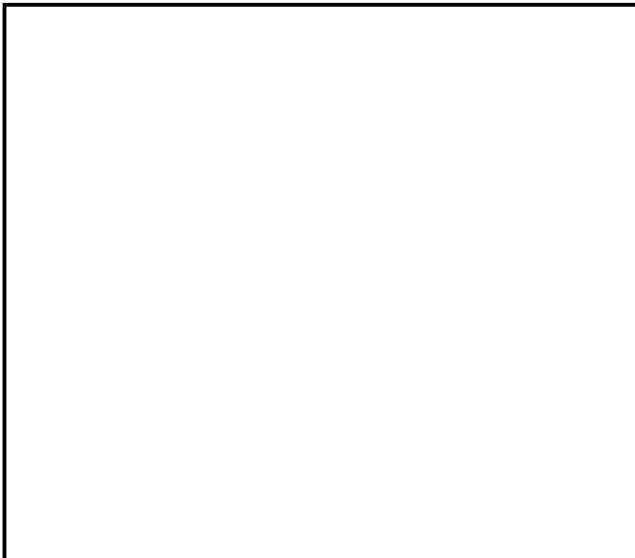
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Table 5
JDB and SBFC Capital Equipment Loans to Manufacturing
Industry Outstanding on 31 December 1981

Industry	JDB		SBFC	
	<i>Million US \$</i>	<i>Percent</i>	<i>Million US \$</i>	<i>Percent</i>
Total manufacturing	6,292	100.0^a	6,020	100.0^a
Chemicals	1,150	18.3	199	3.3
Oil refining	1,413	22.5	20	0.4
Ceramics and cement	518	8.2	525	8.7
Iron and steel	1,200	19.1	269	4.5
Nonferrous metals	306	4.9	97	1.6
Metal products	123	2.0	740	12.3
General machinery	74	1.2	606	10.1
Electrical machinery	180	2.9	370	6.1
Transportation machinery	354	5.6	224	3.7
Precision machinery	27	0.4	118	2.0
Other manufacturing	947	15.0	2,852	47.3

^a Because of rounding, components may not add to totals shown.



Under the special tax-free reserve, taxes are deferred, not exempted, for funds placed in reserve. For example, the money placed in a bad debt reserve in each accounting period minus actual bad debt losses must be added to income in the following period. Japan has two types of tax-free reserves. One category includes

reserves for bad debts, retirement pensions, and any other purpose justified by generally accepted accounting principles. The Finance Ministry believes that companies are holding reserves larger than necessary to cover claims on these accounts and is pushing for reductions in FY 1983.

Of greater importance to industrial policy are special reserves established in the Special Taxation Measures Law. The Finance Ministry estimates that these reserves resulted in a \$154 million revenue loss in FY 1981. Those of special benefit include reserves for:

- Overseas market development by small business (estimated FY 1981 revenue loss—\$18 million).
- Overseas investment loss (under \$1 million).
- Investment loss in the Okinawa Free Trade Zone.
- Construction of atomic power generation facilities (\$92 million).
- Construction of certain gas distribution facilities.
- Losses from the repurchase of electronic computers (\$9 million).
- Domestically produced computer programs.

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As diverse as the list of special reserves is, it nevertheless supports the notion that all the tools of industrial policy are used in an integrated fashion to accomplish priority objectives. Tokyo supports the development of a nuclear power industry, for example, not only with large R&D expenditures but also with special financing programs and special depreciation reserves. [REDACTED]

The reserve for losses from the repurchase of electronic computers is another example. The Japan Electronic Computer Company (JECC) was founded in 1961 to purchase hardware and software from its shareholder computer manufacturing companies and then to lease them to users. This relieved the companies of the costs of financing sales. JECC receives its operating capital in the form of loans from the Japan Development Bank and private financial institutions. The special tax reserve has also contributed substantially to JECC's cash flow. In FY 1972 the reserve was worth \$34 million. Since then it has declined in value to an estimated \$9 million in FY 1981. The Ministry of Finance has listed the reserve for losses from repurchase of computers as one of the unfair tax breaks that should be eliminated in 1983. [REDACTED]

Tax credits and deductions from income, the third type of special tax measure, cut tax revenue by \$207 million in FY 1981. The most important tax credit is for increased R&D: 20 percent of expenditures in excess of the largest previous outlay can be credited against the corporation's tax liability up to a maximum of 10 percent of total tax liability. The Ministry of Finance estimates that such credits were worth \$119 million in FY 1981. This provision of the special measures law will expire on 31 March 1983, unless extended by the Diet. [REDACTED]

Some special deductions from income also are designed to encourage R&D. Corporations earning income from the export of patents, copyrights, and technical services associated with plant and equipment exports are allowed to deduct a percentage not to exceed 40 percent of corporate income. The total revenue loss for FY 1981 is estimated at \$66 million. [REDACTED]

Challenges for the System

Control Over Research and Development. Statistics on R&D spending suggest that MITI lacks the centralized direction over R&D programs necessary to make the most of its influence on the research activities of business. MITI's share of total general account R&D expenditures exceeds 50 percent only when the Agency of National Resources and Energy's entire budget, which is only partly devoted to R&D, is included. When only nonenergy R&D is considered, MITI's share drops to 27 percent. [REDACTED]

MITI's rival for leadership of government civilian R&D policy is the Science and Technology Agency (STA), a branch of the Prime Minister's Office. Half of the government's nonenergy R&D spending is under STA's jurisdiction. It describes its mission in terms remarkably similar to MITI's, which may be a tribute to the Long-Term Vision's effectiveness as propaganda in the sense that many people outside MITI are now thinking along the same lines. In terms of bureaucratic politics, however, it indicates that MITI faces serious competition for leadership of Japan's R&D effort. [REDACTED]

STA's responsibilities include the promotion of:

- Technology to assure a stable supply of natural resources.
- Health-and-safety technology.
- Research on nuclear energy, aerospace, ocean development, and material sciences. [REDACTED]



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within an industry. In the United States much of this essential trading of information is facilitated by professional organizations and through the mobility of research workers between research institutions. Informal leakage of information through these channels also compels companies to place proprietary knowledge on the market quickly. If companies wait too long, informal leakage destroys the uniqueness of the product and therefore its monetary value. [REDACTED]

In Japan the prevalence of in-house training and permanent employment for R&D workers limits the opportunities for this informal exchange. In the short run, firms with unique technologies may benefit from the relative isolation of their workers, but over longer spans of time, compartmentalization of information may slow the technological progress of the entire economy. [REDACTED]

Throughout the postwar period, MITI has worked hard to ensure a fairly wide diffusion of technology within Japanese industries. At first, MITI used its control over licensing of foreign technology to prevent one firm from monopolizing information. MITI, for example, prevented Nippon Kokan and Yawata Steel from gaining exclusive rights to the Basic Oxygen Furnace technology that proved to be the basis for Japanese success in the steel industry. Nippon Kokan became the general licensee for the Austrian technology with the proviso that sublicenses would be available to any other Japanese steelmaker. MITI still retains the right to control imports of technology in the aerospace, computer, microelectronic, and nuclear fields. [REDACTED]

Since the early 1960s, cooperative R&D projects have been used to promote technology in strategic industries. When the very-large-scale-integration (VLSI) semiconductor research project began in the 1970s, MITI offered \$133 million in direct government subsidies over four years, in addition to the customary 100-percent depreciation on fixed assets of a research association, to entice Nippon Electric, Toshiba, Hitachi, Fujitsu, and Mitsubishi Electric into establishing the Technology Research Association. However, even a joint laboratory failed to dissolve the interfirm

Sustaining Research Associations. Business's reluctance to concentrate too much influence over R&D policy in MITI's hands may reflect the Ministry's practice of using research associations and other devices to force the diffusion of technology among firms. Diffusion of technological information is generally a prerequisite for rapid technological advance

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barriers completely, according to a US economist who has studied the project. Each company team participating in the project brought its own technology and equipment into the project and took from it further advances on company-specific information. [REDACTED]

To get around the obstacles encountered in the VLSI effort, MITI has changed the structure of recent large-scale projects (see table 6). Because government funds supplied to participants in the VLSI projects were technically loans subject to repayment if the new technologies became profitable within five years,³ companies retained the patent rights to innovations by their own employees. In most of the newer projects, companies are conducting research under contract and all patents belong to the government. [REDACTED]

Government ownership of patents, however, is a workable formula only in fields where Japan is lagging behind foreign competitors. In areas where Japanese firms already possess world-class technology, we believe leading firms will become increasingly reluctant to participate in projects that could result in passing technology to competitors. Yamazaki Machine Works, a leader in using numerically controlled machine tools and robots, initially refused to participate in a recent industrywide project, according to interviews with the company president. Yamazaki agreed only after MITI put pressure on the company's bank. [REDACTED]

In the future, firms more powerful than Yamazaki might not submit to outside pressure, and as a result MITI must devise a new formula. One solution may be to give participants preferential use of patents developed in the project. Japanese trade publications report that such ideas have been raised in connection with the semiconductor portion of MITI's R&D projects on basic technologies for new industries. Once individual firms are given preference, however, the justification for financing the research with public funds is weakened. [REDACTED]

[REDACTED]

The Future. The widely perceived success of MITI's industrial policies over the past 30 years has made it one of the top ministries within the Japanese bureaucracy. It will not readily abandon a policymaking activity that has served it so well. At the same time, flexibility has been a hallmark of Japanese industrial policy, and continued changes in the instruments used to shape industrial development and in the target industries can be expected. The fine ceramics industry, for example, is now being targeted as a growth industry. On 23 July, MITI announced the formation of a fine ceramics section, which will collect statistical data on the industry, write future "visions" for the industry, and coordinate with the Agency of Industrial Science and Technology to improve basic technology in the industry. The new law MITI is drafting to deal with depressed industries will probably add aluminum refining, petrochemicals, chemical fertilizers, pulp and paper, electric steel, and ferroalloys to the list of industries that can be reorganized outside the constraints of the antimonopoly law. [REDACTED]

Changes in the official financial institutions supporting industrial policy are also likely. In FY 1983, for example, the JDB is planning a new \$44 million loan program to finance 50 percent of the cost of R&D facilities for advanced technologies, according to Japanese press reports. To encourage capital investment by small business, MITI wants to raise the present \$700,000 SBFC loan limit to \$1,060,000 and extend the length of the repayment period:

- MITI hopes to include interest subsidies for SBFC in the general account budget so that the interest rate on loans for capital investment can be held down. Whereas the long-term prime rate was hiked to 8.9 percent on 1 September and the JDB's basic rate will be raised to the same level on 1 October, the SBFC's basic rate will only be raised to 8.4 percent on 1 January 1983.
- The SBFC may be authorized to make loans to venture capital businesses. [REDACTED]

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Table 6
Japan: Research Associations Formed in 1981

Research Association (RA)	Number of Corporate Participants	Research Areas	Duration of Project (years)	Government Funding ^a (million US \$)
Fine Ceramics Technology	15	Engineering ceramics	10	59
High Polymer Basic Technology Research and Development Association	11	High-efficiency substance separating membrane materials	10	45
		Electrically conductive high polymer materials	10	23
		Highly crystalline high polymer materials	10	27
Next Generation Metal and Composite Material RA	17	High-efficiency crystallization-control alloys	8	36
		Composite materials	8	50
Biotechnology Development RA	14	Bioreactors	10	50
		Massive biotechnical cell cultures	9	23
		Recombinant DNA application technology	10	45
New Function Semiconductor Research and Development Association	10	Superlattice electronic elements	10	36
		Three-dimensional electronic circuit elements	10	41
		Electronic elements designed to resist environmental effects	8	36

^a Government funding will be matched by private funding.

JDB is also likely to allow borrowing by foreign-owned companies. It is still uncertain, however, whether a special program will be created to make loans to foreign affiliates or whether the firms will have to compete against domestically owned corporations for existing funds. [REDACTED]

MITI's industrial policy makers will be operating in an increasingly difficult environment during the 1980s. Prime Minister Suzuki's policy of fiscal austerity has reduced the size and impact of the financial inducements available to influence business behavior. It also has reinforced the Ministry of Finance's determination to reduce special tax breaks. The traditional response to budgetary stringency has been to place greater reliance on the lending activities of

government financial institutions. Moreover, the Liberal Democratic Party's recent decision to postpone changes that would have reduced the attractiveness of deposits in the postal savings system should increase the flow of funds available to government financial institutions for the next three to four years. Thereafter, however, liberalization of capital markets and the banking system is likely to reverse the situation. [REDACTED]

The high growth of the pre-1973 era reduced the risks of industrial policy. As long as the economy was growing rapidly, almost any industry MITI chose to

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promote was destined to succeed. But in a low-growth environment, mistakes in judgment will be more obvious and could ultimately undermine MITI's reputation for prescience. Slow growth also has increased the probability of interindustry conflicts that can paralyze the policymaking process. Recent conflict between oil refiners and petrochemical manufacturers over the issue of importing more naptha exemplifies this phenomenon.

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Appendix

MITI's View of Challenges Facing Japan in the 1980s

According to MITI's "Vision for the 1980s," the challenges destined to force changes in Japan's industrial structure during the 1980s fall into two broad categories: international and domestic. In the international environment, MITI foresees:

- A more complex, multipolar political and economic system even though the bipolar US-Soviet military balance should persist.
- Rising prices and dwindling supplies of natural resources and energy.
- Trade friction with advanced countries unless Japan makes major changes in the composition of its foreign trade.
- Increased competition from newly industrializing countries (NICs). [redacted]

The MITI analysis of the trend toward a multipolar world is far less probing and insightful than analysis being done by Japan's Ministry of Foreign Affairs. Although the diplomats recognize that Japan might have to assume greater responsibilities in defense and foreign affairs, MITI draws no connection between Japan's international activities and the US-Soviet balance. [redacted]

In MITI's view, most of the inexpensive, easily performed steps in energy conservation have been carried out. Hereafter, conservation will require development of new technologies and large capital investments. Industries that rely on foreign sources of raw materials and energy will have to invest in overseas resource development projects. The problem of resource constraints has been most acute for industries dependent on oil as a feedstock or energy source. MITI expects constraints to become increasingly serious in the case of iron ore and metallurgical coal for the steel industry, nonferrous metal ores for nonferrous metals refiners, and wood resources for pulp and paper. Reflecting these concerns MITI emphasizes the need to develop a higher degree of economic interdependence with resource-rich countries, including the Soviet Union and those of OPEC. [redacted]

Trade friction, in the MITI view, has a number of causes, not the least of which are the two oil crises. High prices for oil have not only trimmed potential world economic growth but also have given the industrial countries a substantial balance-of-trade deficit, particularly with OPEC members. The combination of slow or even negative growth combined with a trade deficit lessens tolerance for imports of manufactured goods. The Japanese also point to wide variances in the rate of productivity increase in key industries such as steel and automobiles in advanced countries as a second cause. A higher rate of productivity increase, in their view, is generally equated with superior international competitiveness. [redacted]

However, it is worth noting that higher absolute levels of productivity have not been the primary source of Japan's international competitiveness in the initial stage of any industry's development. The initial advantage has always been lower labor costs. The profits from successes in first the domestic and then the export markets are reinvested to increase productivity. According to a report just released by the Japan Productivity Center, steel and automobile industries far along in this process were the only Japanese industries projected to have a higher absolute level of productivity than their US counterparts in 1980. [redacted]

Japanese analysts expect competition from newly industrialized countries to intensify. According to MITI, this competition will be greatest in capital-intensive basic materials industries (steel, chemicals, and the like). When NIC domestic demand for the output of these industries is inadequate, NICs will launch export drives that will place Japan's capital-intensive materials industries in the same predicament that labor-intensive textiles and sundries faced in the 1970s. Japanese industries will have to deemphasize production of basic manufactures, which NICs can

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generally perform at lower costs, in favor of more sophisticated goods requiring special facilities and engineering expertise. Companies that want to continue selling basic products will probably find it more profitable to build factories overseas. []

Major changes in the domestic environment during the 1980s also offer challenges:

- Diversification of business and consumer preferences.
- An aging population.
- Increasing numbers of working women. []

Rises in per capita income (Japanese per capita GNP reached \$8,860 in 1980) are stimulating significant changes in consumer preferences and business needs. Reliability, durability, and low cost were once sufficient attributes for automobiles and household electrical goods sold in Japan, but consumers are now also insisting that their purchases have style, ease of use, and minimal noise levels as well. When buying clothing, consumers now look for variety, fashion appeal, and design. As businesses become larger and more prosperous, their requirement for specialized services such as market research, corporate planning, information management, in-house training, and security, grows. MITI projects that these trends will help develop new service industries. []

Japan now faces the prospect of a population structure that will contain a percentage of people over 65 years of age much higher than that of any other advanced country. The situation is even more dramatic in the case of people over 55, the most common retirement age for career employees in Japan. They constituted 15.5 percent of the labor force in 1978 and will constitute 23.5 percent in the year 2000. Increasing numbers of older people will have a dramatic impact on national and corporate finances. Social security expenditures will take up a growing portion of the government budget. To reduce the burden of social security payments and retirement payments, companies are already under pressure to raise the retirement age. Even so, MITI acknowledges that central and local government expenditures, which now account for 28 percent of GNP, are likely to consume an increasing share of national product. []

Table 7
Japan: Population Trends

	Population Projection (millions)	Over Age 65 (percent)
1980	117	9.1
1990	124	11.8
2000	129	16.4
2010	134	20.4
2020	128	24.1

The percentage of the labor force that is female has risen to 34 percent in recent years, and this trend should become even stronger through the 1980s. Of special note is the rising percentage of the female labor force that is married. The figure jumped from 51 percent in 1970 to 66 percent in 1978 (including temporary employees). Economic pressures on household budgets are one reason for more married women participating in the labor force. Another reason is a growing demand from women for outside careers as their children leave early childhood and their free time increases. []

With these trends in mind, MITI argues that Japan must accelerate its move into knowledge-intensive industries such as computers. Simply put, knowledge intensification involves development of new industries or new products by old industries that depend on advanced engineering design, software programs, marketing research, advertising, and other services instead of capital, labor, energy, or raw material inputs. This concept dates back to the beginning of the 1970s. It had the virtue of tying concern for the popular political issues of that period—the environment, resource conservation, and a welfare-oriented society—to a continued commitment to the development of new industries in which Japan could potentially achieve an international competitive advantage. The novel element in the 1980s version of the idea is

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the emphasis on creativity. Japan's earlier successes stemmed in large part from skillful adaptation of foreign technology and ideas. The drafters of the Vision for the Eighties recognize that continued success will require new technological breakthroughs in Japan, or at the very least, innovative combinations and refinements of existing technologies. [REDACTED]

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MITI will continue to push for development of alternative energy or energy conservation technologies to reduce Japan's dependence on outside sources of raw materials and energy and enhance Japan's international bargaining power. Manufacturers will be urged to develop more sophisticated products that would be less exposed to competition from NICs. [REDACTED]

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Established industries, not just growing high-technology industries, also stand to gain from the development of technologically sophisticated goods. Rather than competing head on with NIC steelmakers for sales of ordinary steels, the Japanese industry will emphasize high-value finished steel products such as seamless pipe. [REDACTED]

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Technological innovation will also help overcome the domestic challenges of diversifying consumer demands and an aging population structure. Flexible manufacturing systems making extensive use of robots and computer-controlled machine tools will enable manufacturers of the entire range of hard goods to produce models to satisfy a variety of consumer preferences. Automated sewing systems will give apparel manufacturers similar flexibility to respond rapidly to changes in current fashions. [REDACTED]

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